Description

The Canberra Model 816 Spectroscopy Amplifier features a functional design for the researcher not requiring the versatility contained in some of Canberra's other amplifiers such as the Model 1417B. The Model 816 is noted for its simplicity of operation, dependability, and long life. In contrast with its low cost and general purpose range of applications are features that are found in considerably more expensive amplifiers. To name a few:

- Adjustable Pole/Zero cancellation
- Active element pulse shaping
- Linear integrated circuit construction
- Ultra-low noise contribution
- Highly linear gain response
- Constant gain regardless of output mode selected
- Internal selection of 0.5 or 2.0 microsecond Gaussian shaping

Specifications

**INPUTS**

- SIGNAL INPUT: positive or negative tail pulse from associated preamplifier, 0 to 4 volts before input saturation, 12 volts maximum; 0 to 1 microsecond rise time, 30 to 1000 microsecond fall time; input impedance 1000 ohms, DC coupled

**OUTPUTS**

- OUTPUT: unipolar or bipolar (as switch-selected), positive 0 to 10 volt linear pulses, 11 volts saturation unterminated; pulse shape near-Gaussian, time constants as selected internally; output impedance less than 3 ohms, DC coupled

**PERFORMANCE**

- LINEARITY: better than ±0.2% integral from 0 to 9 volts output into 100 ohms
- SHAPING: selectable unipolar or bipolar time constants of 0.5 or 2 microseconds; near-Gaussian pulse shape
- GAIN STABILITY: better than ±0.02% per°C, better than ±0.01% over 24 hours at constant temperature
- GAIN CONSTANCY: constant amplifier gain for unipolar or bipolar shaping to within 3%
- OVERLOAD RECOVERY: recovery to within 2% of baseline from 250X overload within two non-overloaded pulse widths, at full gain for bipolar shaping
Specifications (continued)

DC LEVEL STABILITY - better than 2mV/°C (0 to 50°C), better than 10mV over 24 hours at constant temperature
COUNT RATE STABILITY - less than 0.5% gain change (Cesium 137 peak) in presence of 50kHz pulser input
CROSSOVER WALK - less than ±8 nanoseconds over 20:1 dynamic range (0.5 volts to 10.0 volts) including contribution of Canberra Model 835 Timing SCA; less than ±15 nanoseconds over 50:1 dynamic range
NOISE - less than 8 microvolts referred to the input at full gain and 2 microsecond unipolar shaping, less than 12 microvolts at 0.5 microsecond unipolar shaping, less than 12 microvolts at 2 microsecond bipolar shaping
GAIN - maximum gain 500; adjustable via front panel controls over 50:1 range

CONTROLS
COARSE GAIN - front panel rotary switch, 16:1 range in five binary steps
FINE GAIN - front panel single-turn precision potentiometer, greater than 3:1 range (ten-turn control optional, add $25.00)
POLE/ZERO - front panel single turn screwdriver adjustment potentiometer to optimize amplifier baseline recovery and overload performance for the preamplifier time constant and the main amplifier pulse shaping chosen
INPUT POLARITY - front panel toggle switch, POS and NEG positions
OUTPUT MODE - front panel toggle switch, UNI(polar) and BI(polar) positions
TIME CONSTANTS - internal jumper to select shaping time constants of 0.5 or 2.0 microseconds (while maintaining near-Gaussing pulse shaping)
DC LEVEL - internal control to set OUTPUT DC level to zero volts

CONNECTORS
SIGNAL INPUT - BNC, UG-1094/U, front panel
OUTPUT - BNC, UG-1094/U, front panel
PREAMP POWER - Amphenol 17-10090, rear panel

POWER
+24V - 30mA +12V - 35mA
-24V - 30mA -12V - 30mA

PHYSICAL
SIZE - standard single width module (1.35 inches wide) per TID-20893
WEIGHT - 2.2 lb.

OPTIONS
Ten-turn FINE GAIN potentiometer and dial, specify Model 816A, additional charge $25.00